

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

1.9
37 Ch

UNITED STATES DEPARTMENT OF AGRICULTURE
Weather Bureau
Washington

LIBRARY
RECEIVED
DEC 2 1931
U. S. Department of Agriculture

Office of the Chief

November 25, 1931.

CIRCULAR

CHANGES IN METHOD OF RECORDING AZIMUTH ANGLES IN
PILOT BALLOON OBSERVATIONS.

Effective January 1, 1932, the present system of reckoning azimuth angles in pilot balloon observations will be changed. The object of these changes is to make wind directions, as finally recorded in terms of angles on all Forms as well as in all published data, to be so expressed that wind directions therein recorded as 0° , 90° , 180° , and 270° represent winds from the N, E, S, and W respectively, the intermediate directions being consistent with this system.

To accomplish this object the following changes will be made in procedure, forms, etc.;

(1) In regular daily single theodolite observations the theodolite will be oriented so that the horizontal circle will read 0° when the telescope points due south, instead of north as at present. Therefore, the old reference points may be adapted to this new system by adding or subtracting 180° to the present azimuth readings and applying the resulting values as the proper theodolite settings on the points in question under the new system. For example; if a reference point under the old system had an azimuth reading 20.5 degrees, 180 degrees should be added and the new theodolite setting on this point will be 200.5 degrees; or if a reference point had an azimuth of 210.4 degrees, 180 degrees should be subtracted and the new setting on this point will be 30.4 degrees.

(2) Direction letters on plotting board protractors at all stations will be changed so that adjacent to 0° , 90° , 180° , and 270° the new direction letters read N, E, S, and W, respectively, etc., i.e. the new directions are to be the reverse of the old ones: SW changes to NE, SSW to NNE, S to N, etc.

(3) If revised Forms 1115-Aer. (with the direction letters at the top the reverse of the old ones, as indicated above) are not received by any pilot balloon station prior to January 1, 1932, observers at the station will change the direction letters at the tops of the old forms to conform with the new system. Under these circumstances, upon receipt of the new forms, the old forms are to be mailed to the Central Office, and the new ones used exclusively.

Stations receiving the revised forms in time will begin using them on January 1, 1932. Old Forms 1115-Aer. in this case are to be mailed to the Central Office shortly after that date.

(4) Circular O is to be corrected as follows:

(a) Paragraph 33-First sentence should read:

"In single-theodolite work the azimuth should be set on zero when the telescope points toward the south."

(b) Paragraph 119-First sentence should read:

"A north wind will be designated as 0° , east as 90° , south as 180° , and west as 270° , etc." Also change the word north which occurs in the second and fourth sentences of this paragraph to the word south.

(c) Paragraph 121-Substitute for second sentence the following:

"In order to do this, instead of reading the direction in the usual manner at the initial line, it is read at a point whose bearing clockwise from the initial line is equal to the bearing of the base line plus or minus 180 degrees. A simple method of locating the point at which the desired protractor reading is to be made is to set the 180° line of the protractor on the initial line and mark a point on the board where the protractor reads an angle equal to the bearing of the base line from north."

(d) Paragraph 135-First sentence should read:

"Set the protractor of the plotting board on zero degrees if the north component is plus and on 180 degrees if it is minus and plot its length along the initial line; then set the protractor on 270 degrees if the west component is plus and on 90 degrees if it is minus and add its length along the vertical line from the first point."

As will be seen, the above is a reversal of the procedure used in the past. Moreover, only the graphical method of computing resultants on Form No. 1124-Aer. is affected; the slide-rule method remaining unchanged.

It will be noted that, under the method of recording azimuths in use at present, the azimuths of reference points and of the balloon's various positions are all reckoned by the system in which 0 or 360 degrees designates north while the azimuths of the directions from which the wind is blowing are reckoned by a second system in which 0 or 360 degrees designates south. That is, one system is used for indicating the directions of reference points while another is in use for indicating directions from which the wind is blowing.

The new method, however, recognizes only one system of reckoning azimuths, viz., that in which 0 or 360 degrees represents north, or in other words (a) the bearing or azimuth of any point is considered to be the angle measured clockwise from the line running due north from the observation point as the initial line to the line passing from the observation point through the point in question as the terminal line, and (b) the bearing or azimuth of the compass point from which the wind is blowing is considered to be the angle measured clockwise from the line running due north from the observation point as the initial line to the line passing from the observation point through the compass point in question as the terminal line. There is thus a necessity for a transition during the process of the observation from the direction in which the balloon is moving to the opposite direction - the direction from which the wind is blowing. This transition, as is evident, is made in the very beginning by making the readings of the horizontal circle of the theodolite 180 degrees more or less than the azimuths of the reference points. The distinction is thus emphasized between the terms "azimuth" and "theodolite setting". The azimuth of any reference point is the bearing of that point (reckoned clockwise) from the direction of true north while the theodolite setting on that point is 180 degrees more or less than the azimuth of it.

Special care should be taken when initiating these changes that instructions are faithfully followed, and that the results obtained are correct.

C. F. Marvin,
Chief of Bureau.

